

Woodville Recharge Basin Aquifer Protection Study
BC-07-19-02-29
Projected Scope of Work and Fee Schedule for Phase III
McGlynn Laboratories Inc.

QAPP **\$2,000**

Task 6A: Water Quality Sampling/Data Collection in the Woodville Recharge Basin (12 month)

6.2 Sample surface waters in the Woodville Recharge Basin.

Aimes Sink, Southwood Sink and Blueberry Sink/Moonshine Sink, Chicken Branch

\$5,700 4 storm events sampled with flow measurement at 3 sites)

Aimes Sink costs included in Leon County Lakes Ecology (sample & analysis cost)

\$125 per flow, Water Quality and Metals at \$350 per sample (sample & analysis cost)

\$4,200 12 base flow sample analysis @ 350 per sample (4 quarterly per site)

\$9,900

6.5 Septic Tank Sampling

1500 Geologist assistance

2500 3 shallow wells drilled per OSDS

2,400 3 wells at 3 OSDS sites sampled quarterly @ 200 per site

660 Inflow to 3 sites quarterly (nitrate, Cl and TP @ \$55 per sample)

1,980 9 samples analyzed quarterly (nitrate, Cl and TP @ \$55 per sample)

2,000 2 samples analyzed for organics

\$11,040

6.6 Atmospheric Deposition Sampling.

1000 Three wells installed in National Forrest

1200 Monthly site visits for sample collection (12 x 3) at 100 per visit

1200 Event sampling (4 per site) at 100 per visit

1980 Sample analysis (nitrate and TP) monthly (3x12) at \$55 per sample

\$5,380

**** Laboratory Experiments**

1000 Mesocosm Core Setup (construction)

4000 Mesocosm Experimental Setup (ANOVA array 4x4, quarterly)

3520 Sample Analysis (nitrate, Cl and TP @ \$55 per sample)

\$8,520

6.7 Define the conduit flow utilizing dye studies, the direction of conduit groundwater flow, and the water quality in the Woodville aquifer. Emphasize the area down gradient of the City of Tallahassee sprayfield and, for this portion of the basin.

19,000 Equipment (rental cost is \$28,400-2 studies, 2 months each)

14,000 2 tracer studies at 7000 per study

7 full days per person

\$33,000 (St. Marks, Southwoods Sink, Natural Wells) 2 small 1 big

6.8 Collect and update data on application of residuals, agricultural activities and permit status of sprayfield

\$3,000

6.9 Karst Feature Inventory, continuous assessment of karst features

\$2,000

Subtotal 6A:

\$72,840

Task 6B:

6.1 No piezometric levels groundwater flow monitoring

6.4 Ground water quality sampling in the Woodville Recharge Basin.

*Wells selected and drilled after confirmed results from USGS study

10,000 10 deep wells sampled quarterly at 250 per sampling

8,000 10 samples analyzed quarterly for WRB parameters @ 200 per sample

5,000 5 samples analyzed for organics at 1000 per sample Organics

30,000 3 deep wells drilled with lithology

Subtotal 6B:

\$53,000

Task 7: Hydrologic Vulnerability Assessment in the Woodville Recharge Basin (12 month)
 Projects to be started later

7.0 Geoprobes to analyze surficial sediments (soil and clay classification) and permeabilities			
	\$4,000	6-8 shallow wells placed in areas not covered by deep wells	
7.1 Assess and quantify the transport of pollutants from the CoT Sprayfield to the aquifer.			
	\$1,150	GIS:	\$600
7.2 Assess and quantify the impacts to aquifer water quality due to land disposal of waste water treatment plant residuals.			
	\$1,150	GIS:	\$600
7.3 Assess and quantify the transport of pollutants from residential septic systems to the aquifer.			
	\$1,150	GIS:	\$600
7.4 Assess and quantify the transport of stormwater pollutants to the aquifer due to direct groundwater percolation.			
	\$1,150	GIS:	\$600
7.5 Assess and quantify the transport of stormwater pollutants to the aquifer via runoff/conveyance into open sinks and soil filled karst depressions.			
	\$1,150	GIS:	\$600
7.6 Assess and quantify the transport of pollutants from agricultural activities and other local land uses to the aquifer.			
	\$1,150	GIS:	\$600
7.7 Assess and quantify the transport of atmospheric pollutant loadings to the aquifer.			
	\$1,150	GIS:	\$600
7.8 For each of the basins in the study area, determine the annual volume of (1) direct percolation to the aquifer and (2) the input via runoff and conveyance to the sinks within the basin. Produce a table with these results.			
	\$1,150	GIS:	\$600
7.9 Produce a table of ratios (for the individual basins) that compares the magnitude of runoff/conveyance to direct groundwater percolation			
	\$900	GIS:	\$390
7.10 Produce a second table that normalizes the values determined in Task 7.9 to a scale of 1 to 10.			
	\$105	GIS:	\$75
Subtotal Task 7:	\$14,205	Subtotal GIS Task 7:	\$5,265

Task 8: GIS Mapping/Modeling (begins after data collection)
 Projects to be started later

8.1 Produce County GIS compatible data layers displaying the hydrologic vulnerability of the closed basins in the Woodville Recharge Basin for case and other noted tasks			
	\$2,000	GIS:	\$6,000
8.2 Modeling			
	\$1,500	model software and licensing	
	\$8,500	startup costs (loading data, coordination between model & GIS systems)	
	\$1,500	GIS:	\$5,500
Subtotal Task 8:	\$13,500	Subtotal GIS Task 8:	\$11,500

Task 9: Pollutant Loading Analyses (begins after data collection)
Projects to be started later

- 9.1 Determine the in-place pollutant loadings in the Woodville Recharge Basin.
- 9.1.1 Develop a table of annual in-place non-point pollutant loadings for the individual property parcels (or groups of parcels).
\$760 GIS: \$1,240
- 9.1.2 Produce a color shaded or color coded GIS parcel map that displays in-place pollution loading per acre.
\$760 GIS: \$1,240
- 9.2 Determine the pollutant loadings transported to the aquifer in the Woodville Recharge Basin
- 9.2.1 Determine the total annual pollutant loadings (from mechanisms 7.1 - 7.7) transported into the aquifer beneath each closed basin.
\$760 GIS: \$1,240
- 9.2.2 Produce a table summarizing these values.
\$190 GIS: \$310
- 9.2.3 Produce a table normalizing the values in the table above to a scale from 1 to 10.
\$95 GIS: \$155
- 9.2.4 Produce a County GIS compatible data layer to display both the total loadings per closed basin and the pollutant loadings per acre.
\$760 GIS: \$1,240
- 9.3 Determine aerial distribution of aquifer pollution in the Woodville Recharge Basin
- 9.3.1 Utilizing Models the aerial extent and concentration of aquifer pollution.
\$760 GIS: \$1,240
- 9.3.2 Determine those portions of the aquifer where FDEP drinking water standards could be violated at build out.
\$760 GIS: \$1,240
- 9.3.3 Develop a County GIS compatible map of Woodville Recharge Basin displaying the aquifer pollution findings.
\$760 GIS: \$1,240
- Subtotal Task 9:** \$5,605 **Subtotal GIS Task 9:** \$9,145

Task 10: Propose Mitigation Options and Associated Cost Estimates
Projects to be started later

- 10.1 Based on the findings of the steps above, propose appropriate basin specific mitigation measures that can include, but are not limited to:
- *Restricting the use of septic tanks in aquifer-vulnerable areas.
 - *Modifications to the current TP Smith WRF management plan.
 - *Proposing sewer systems for specific areas of the Woodville Recharge Basin.
 - *Proposing better water quality treatment regulations for stormwater runoff.
 - *Proposing specific stormwater retrofit projects to provide stormwater treatment prior to discharge
 - *Restricting certain land uses or the density of development in aquifer vulnerable areas.
 - *Purchasing of specific aquifer vulnerable lands by government.
 - *Offering tax incentives for placing conservation easements on aquifer vulnerable areas.
 - *Encouraging via incentives, zoning, etc. the development of land parcels that are less likely to cause pollution of the aquifer.
 - *Establish a permit based trust fund to provide the monies to accomplish land and conservation easement purchases.
 - *Other suggestions tendered by the Consultant.

\$17,000

- 10.2 Develop preliminary cost estimates for implementing the land purchase and capital improvement options set forth in 10.1.

\$2,000

Subtotal Task 10.2: \$19,000

Task 11: Prepare Draft Report of the results of Tasks 6 through 10.
Subtotal Task 11: \$3,000

Task 12: Hold public meetings to disseminate and discuss the findings and recommendations of the Study.
Subtotal Task 12: \$3,400

Task 13: Prepare the Final Report for the Woodville Recharge Basin Aquifer Protection Study including task 10 and 12.
Subtotal Task 13: \$7,000

TOTAL All Tasks: \$193,550 **Total all GIS Tasks:** \$25,910

Woodville Recharge Basin Aquifer Protection Study
BC-07-19-02-29
Time Line of Work and Fee Schedule for Phase III
McGlynn Laboratories Inc.

QAPP will be submitted in February 2005

	M-05	A-05	M-05	J-05	J-05	A-05	S-05	O-05	N-05	D-05	J-06	F-06	M-06	A-06	M-06	J-06	J-06	A-06	S-06
Task 6A:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Water Quality Sampling/Data Collection in the Woodville Recharge Basin (12 month)																			
MLI Donation:	1	2	3	4	5	6	7	8	9	10	11	12							
Biweekly water quality samples from wakulla Springs																			
Task 6B:	1	2	3	4	5	6	7	8	9	10	11	12							
Water Quality Sampling/Data Collection in the Woodville Recharge Basin (12 month)																			
Task 7:	1	2	3	4	5	6	7	8	9	10	11	12							
Hydrologic Vulnerability Assessment in the Woodville Recharge Basin (12 month)																			
Task 8:	1	2	3	4	5	6	7	8	9	10	11	12							
GIS Mapping/Modeling (begins after data collection)																			
Task 9:	1	2	3	4	5	6	7	8	9	10	11	12							
Pollutant Loading Analyses (begins after data collection)																			
Task 11:	1	2	3	4	5	6	7	8	9	10	11	12							
Prepare quarterly Draft Report of the results of Tasks 6 through 9																			
Task 10:	1	2	3	4	5	6	7	8	9	10	11	12							
Propose Mitigation Options and Associated Cost Estimates																			
Task 12:	1	2	3	4	5	6	7	8	9	10	11	12							
Hold public meetings to disseminate and discuss the findings and recommendations of the Study.																			
Task 13:	1	2	3	4	5	6	7	8	9	10	11	12							
Prepare the Final Report for the Woodville Recharge Basin Aquifer Protection Study.																			